SAP Signavio

Frontend Accessibility
It’s not just alt text

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Development Expert
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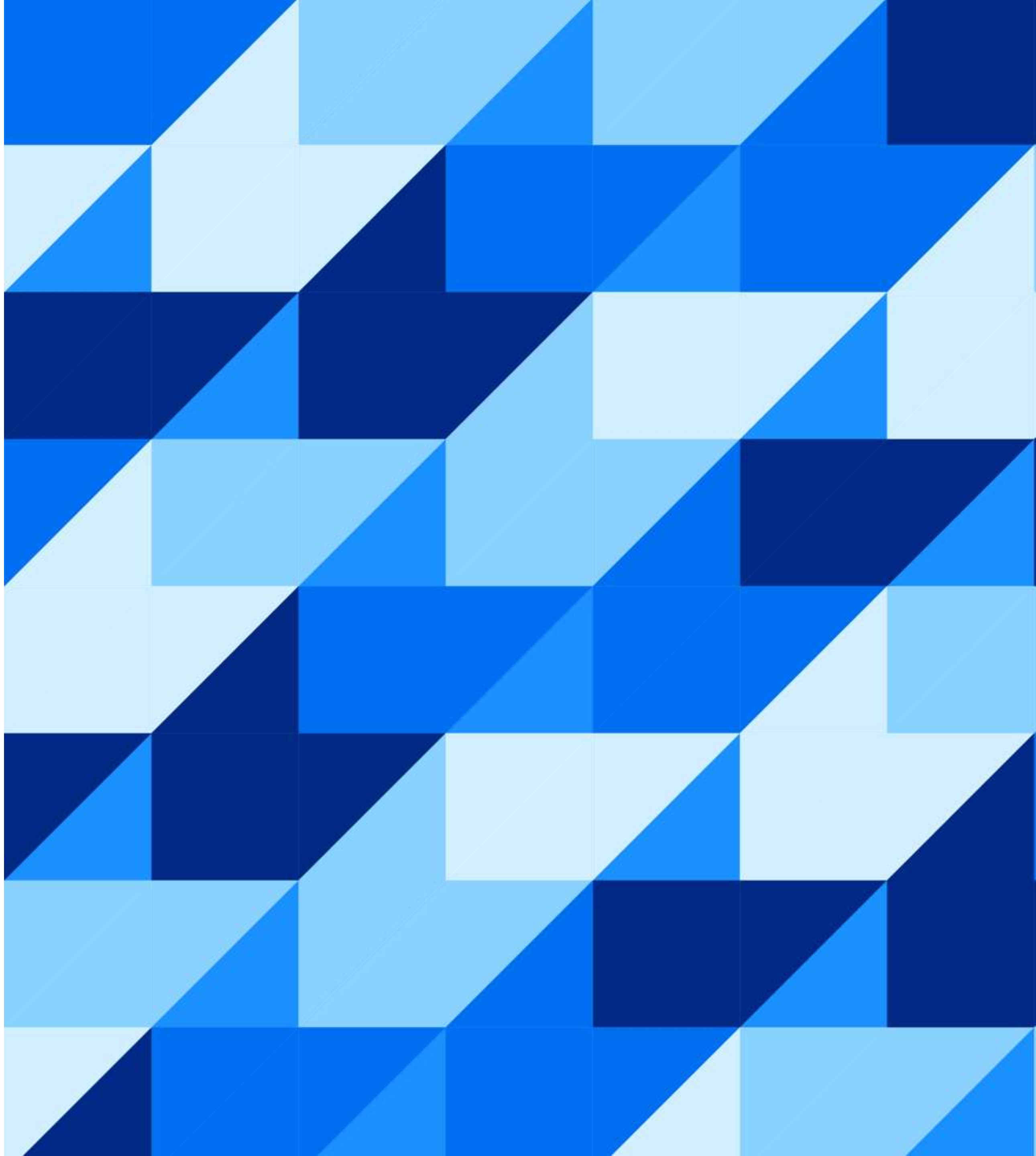
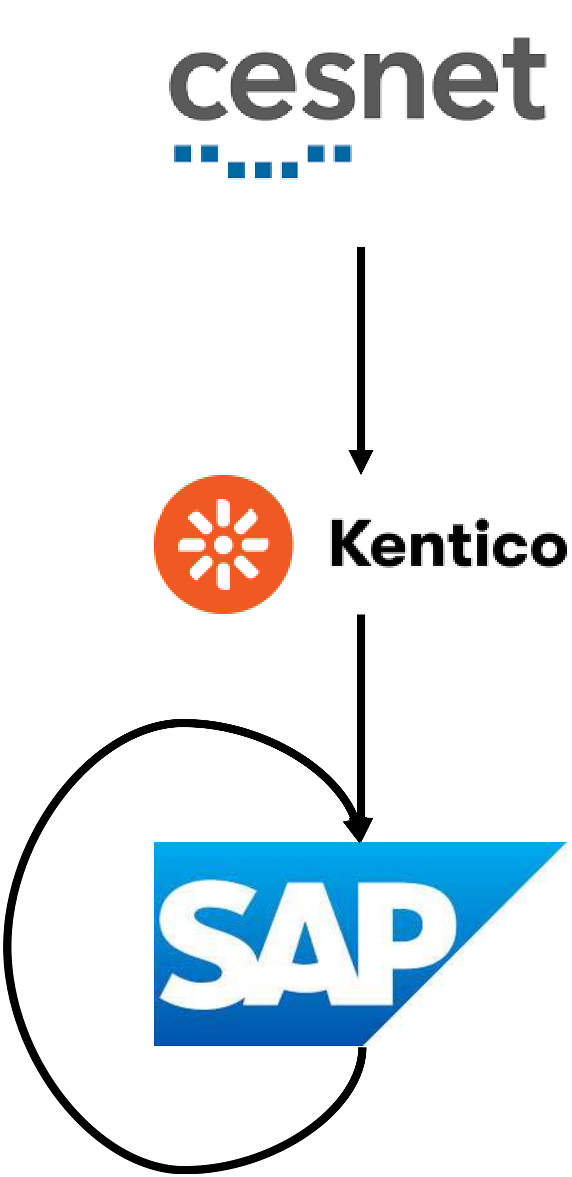


About me



UI5

What is accessibility?

~~What is accessibility?~~

What is NOT accessibility?

Accessibility is not – ability to access something

Accessibility is not – axe‘s ability

The art of combat using two-handed weapons, such as greatswords, battle axes, and warhammers. Those trained in this skill deliver deadlier blows.

Accessibility might be – using axe to control the PC

Accessibility should NOT be

- Just „for blind users“
- Optional, if you care about users
  - (and about business)

What is accessibility?

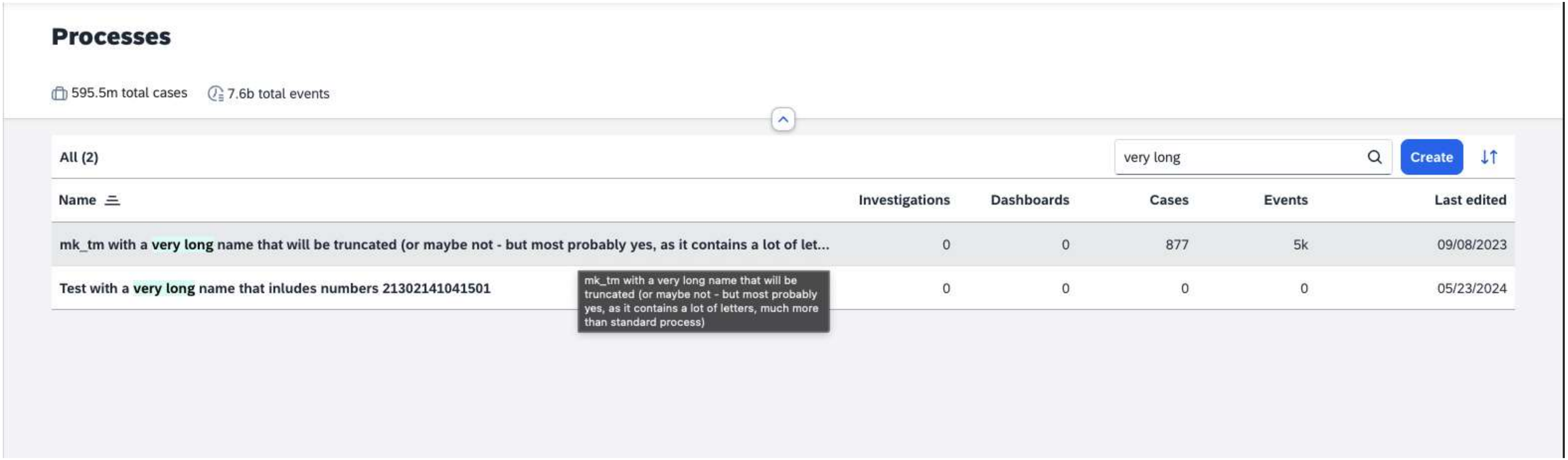
Accessibility

- Making the web usable for everyone, regardless of their abilities
- Covers visual, auditory, motor and other disabilities
- Helps everyone – eg. captions in a noisy room
- Makes product more inclusive, future-proof and human-friendly
- It’s shared responsibility – UX, dev, testing…
- Is part of EU legislation standards
    - “Directive (EU) 2016/2102 on the accessibility of the websites and mobile applications of public sector bodies, the 'Web Accessibility Directive' or 'WAD', obliges all public sector bodies in the EU to make their online websites and mobile apps accessible.”

Accessible UX Examples

Accessible UX – don’t rely on same screen size

- User must always has a way to access the full information



Processes

595.5m total cases   7.6b total events

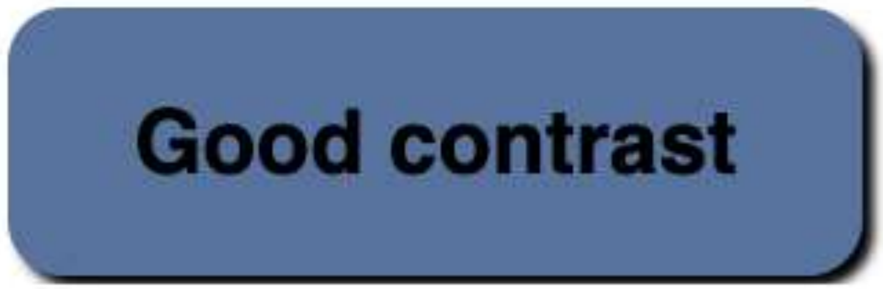
All (2)

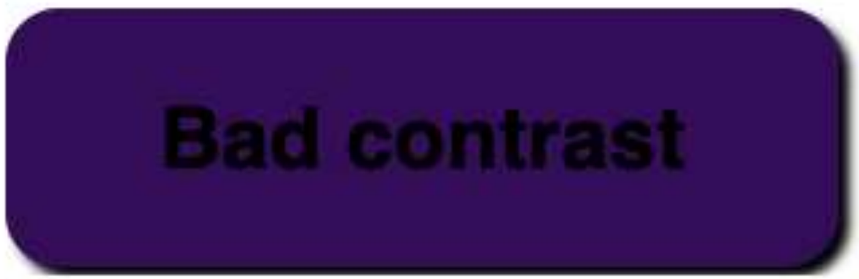
Name	Investigations	Dashboards	Cases	Events	Last edited
mk_tm with a very long name that will be truncated (or maybe not - but most probably yes, as it contains a lot of let...	0	0	877	5k	09/08/2023
Test with a very long name that inludes numbers 21302141041501	0	0	0	0	05/23/2024

mk_tm with a very long name that will be truncated (or maybe not - but most probably yes, as it contains a lot of letters, much more than standard process)

Accessible UX – make it easy for the user

- Proper font size
  - Headers, subheaders, paragraphs
- Right color contrast





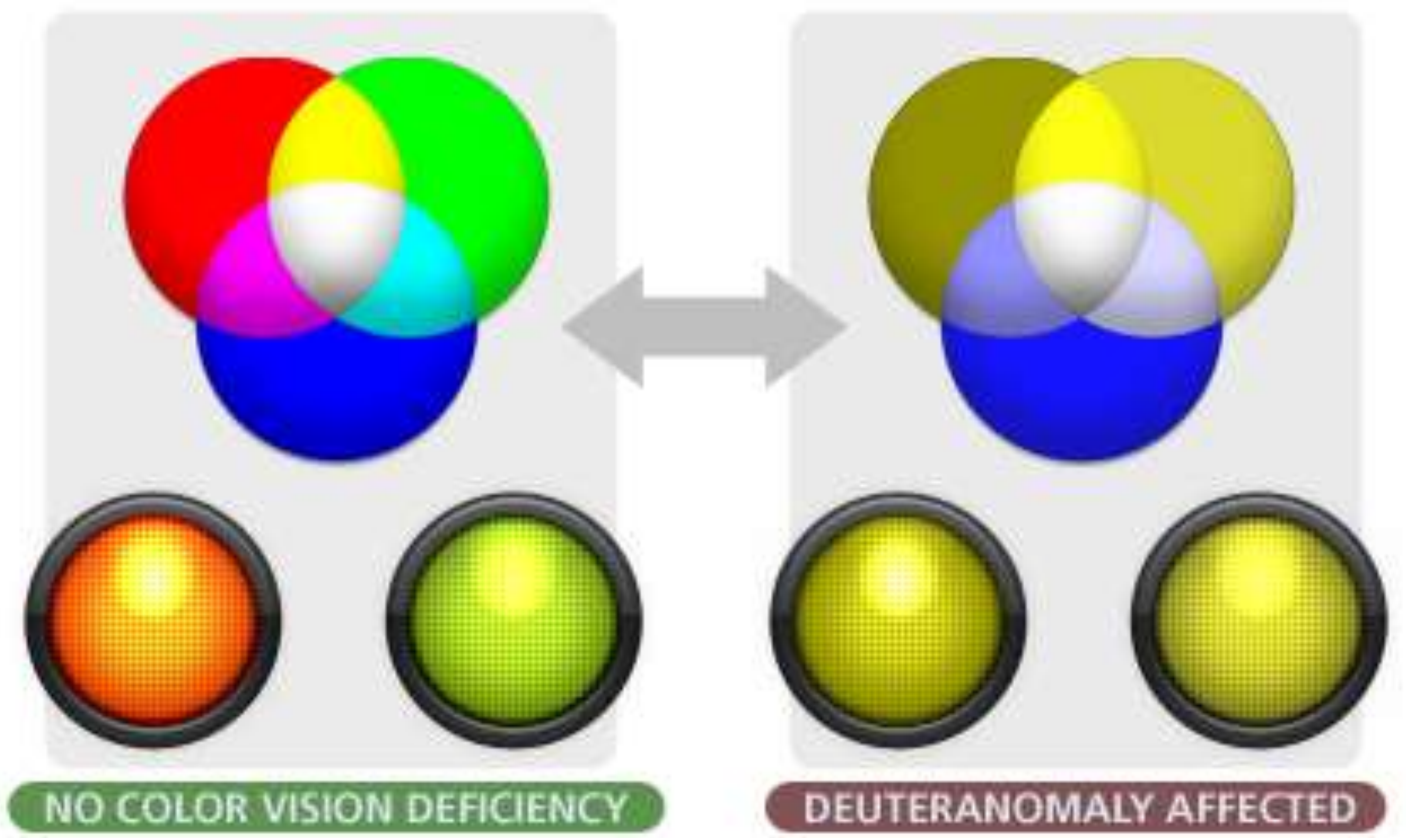
Accessible UX – don’t rely on user’s ability

- “2FA” – 2 factor accessibility
- Quiz – how many colors you see?

Status: Error

Status: OK

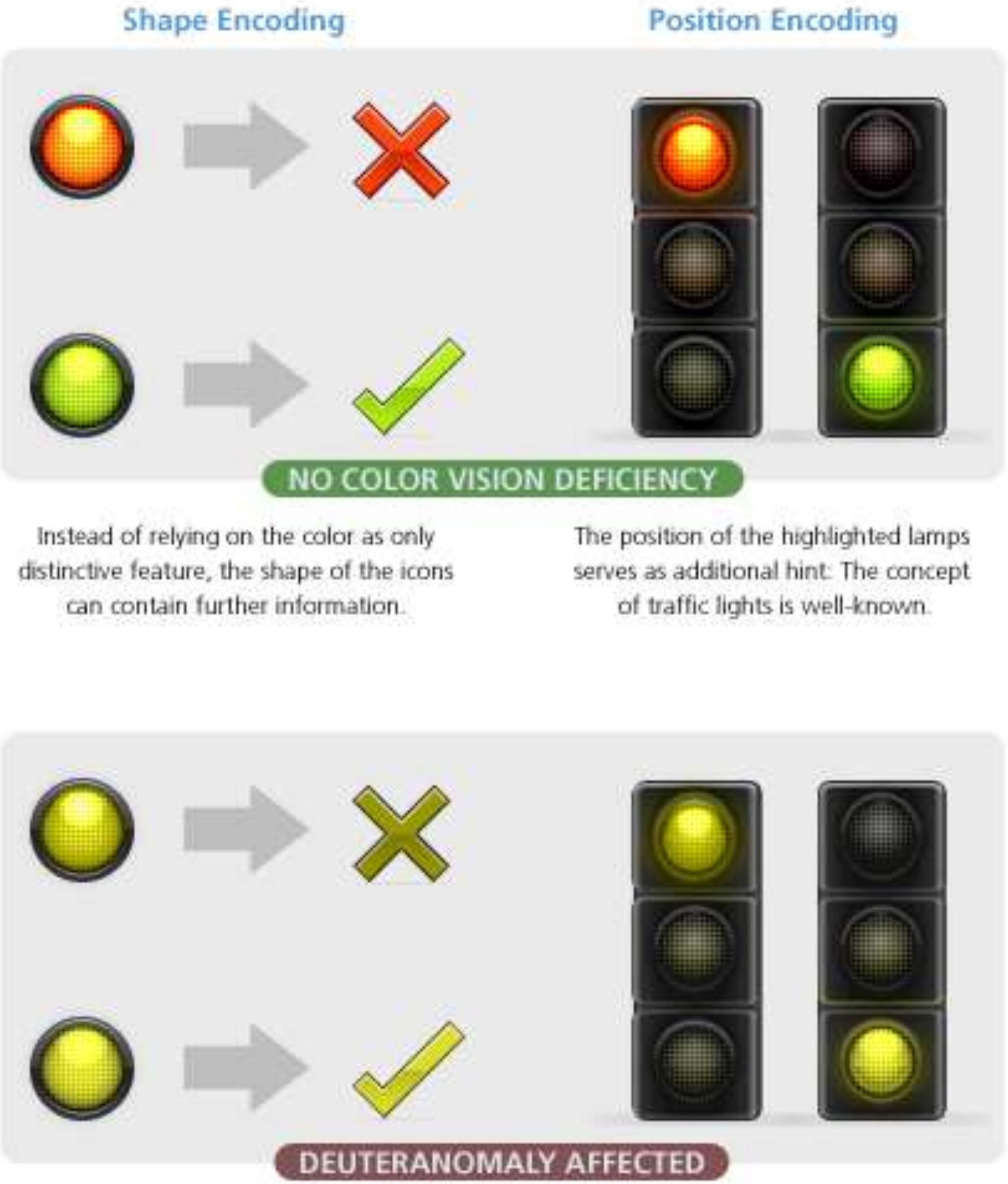
Accessible UX – don’t rely on user’s ability



The RGB color model and two typical warning LEDs, how most people (ca. 85 % of population) would perceive them.

The same objects as left hand, how “green weak” people (ca. 6% of population) would perceive them.

Accessible UX – don’t rely on user’s ability



Instead of relying on the color as only distinctive feature, the shape of the icons can contain further information.

The position of the highlighted lamps serves as additional hint: The concept of traffic lights is well-known.

Accessible UX – don’t rely on user’s ability

- What blind people see:

Accessible UX

- because not everyone can see the teeth

Accessible UI Testing

Accessible UI testing

- Manual testing
  - Keyboard
  - Mouse
  - Screen Readers
    - ChromeVox
    - VoiceOver (MacOS)

- Automated testing
  - Lighthouse
  - axe-core
    - Cypress-axe
    - Jest-axe
    - Playwright-axe
  - Cypress Accessibility

Accessible UI testing

- T-Rex testing
  - Voice Control
  - Sip-and-puff
  - Eye Tracking
  - Head Tracking

HAMILTON
RADIO
“IT'S
HAMMERTIME.”
PETRONAS

DEMO TIME

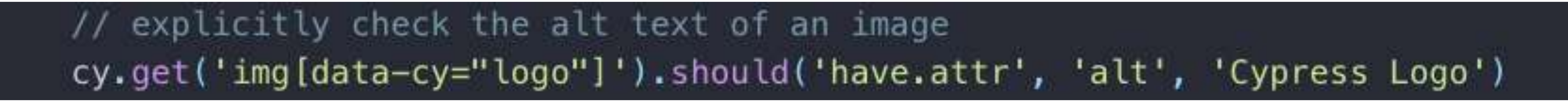
https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/Accessibility/HTML

a11y test automation

a11y test automation – verbose approach

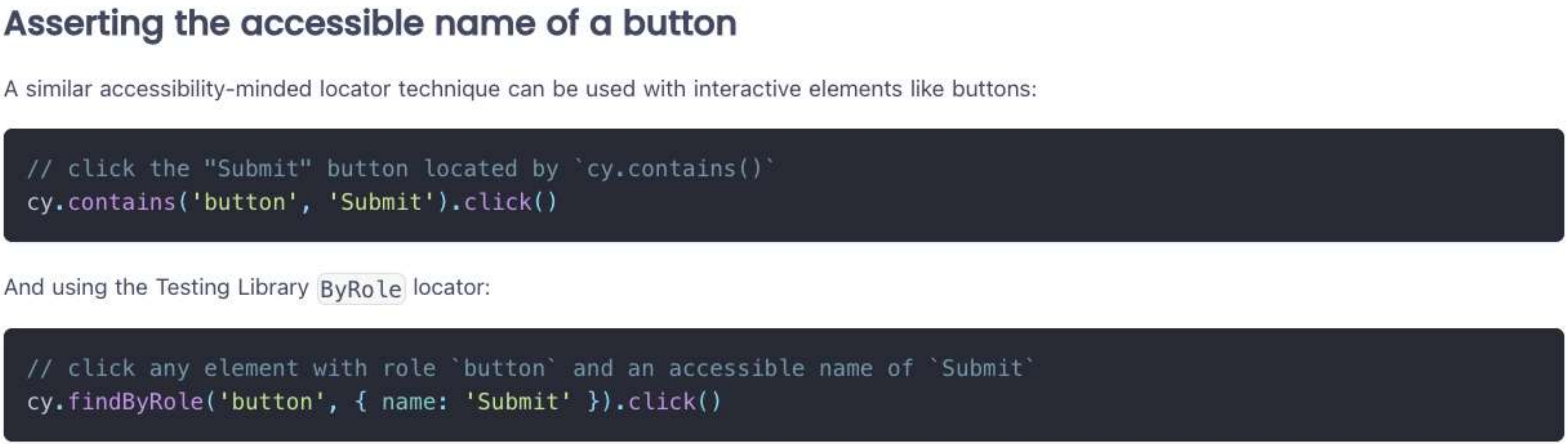
- Pros
  - Explicit testing of every element
  - No need for additional libraries
  - Available in Jest, cypress…

- Cons
  - Explicit testing of every element
  - Easy to miss something
  - A lot of code
  - Can increase test complexity
  - Can increase test run time
  - Single failure = end of test



```
// explicitly check the alt text of an image
cy.get('img[data-cy="logo"]').should('have.attr', 'alt', 'Cypress Logo')
```

a11y test automation – verbose approach



Asserting the accessible name of a button

A similar accessibility-minded locator technique can be used with interactive elements like buttons:

```
// click the "Submit" button located by `cy.contains()`
cy.contains('button', 'Submit').click()
```

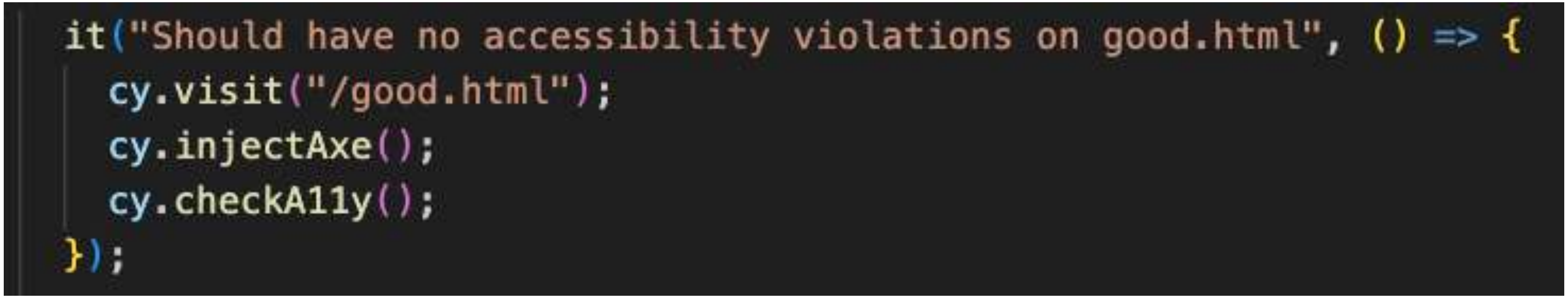
And using the Testing Library `ByRole` locator:

```
// click any element with role `button` and an accessible name of `Submit`
cy.findByRole('button', { name: 'Submit' }).click()
```

a11y test automation – axe approach

- Pros
  - Automatic testing of every element
  - Easy integration
  - Open source
  - Covering a lot of standards
  - Configurable
  - Whole report after test end

- Cons
  - Automatic testing of every element
    - But this can be configured
  - Can increase test complexity
  - Can increase test run time
  - Need to call it multiple times to cover different states



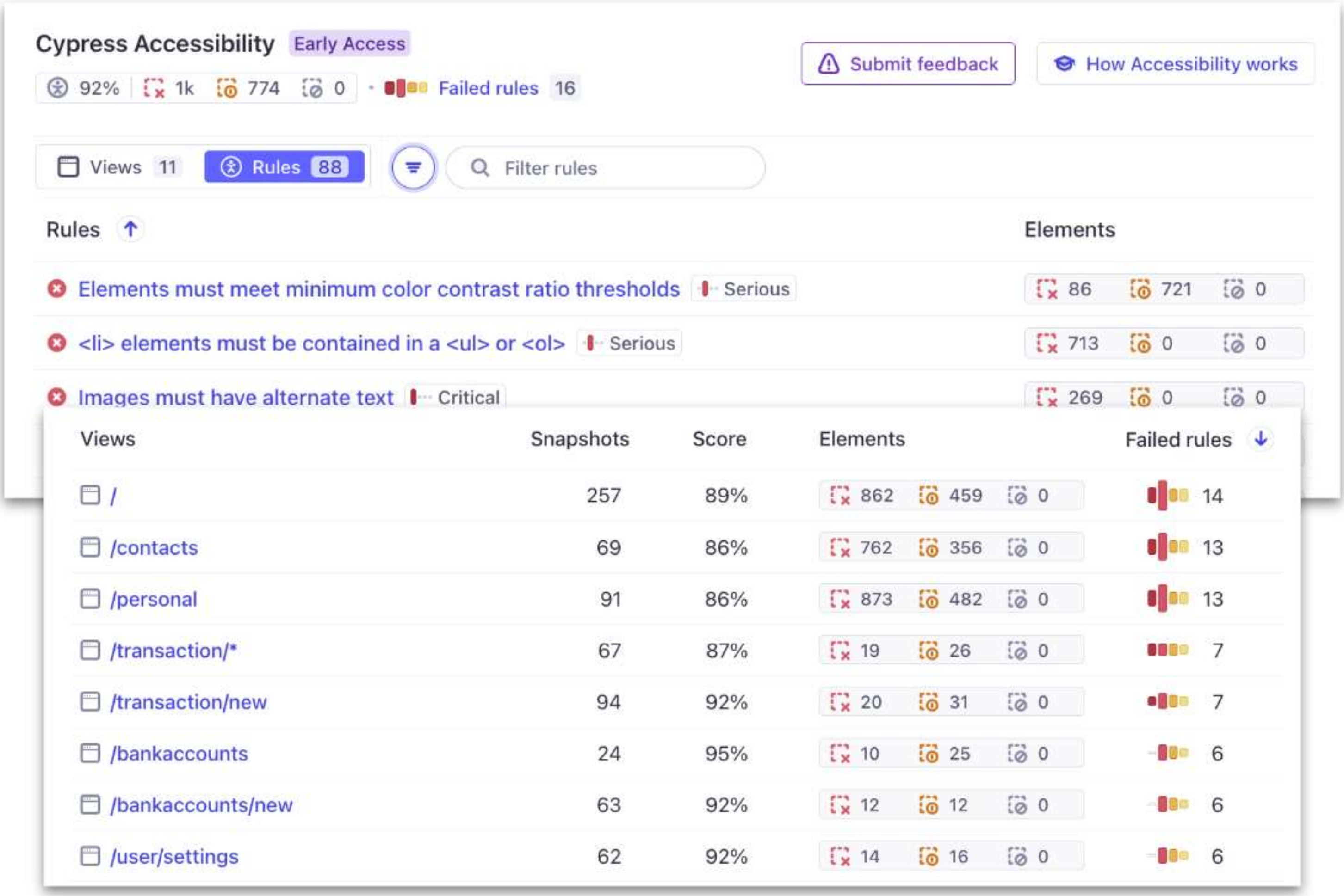
```
it("Should have no accessibility violations on good.html", () => {
  cy.visit("/good.html");
  cy.injectAxe();
  cy.checkA11y();
});
```

a11y test automation – Cypress Accessibility

- Pros
  - No configuration
  - Using axe under the hood
  - Testing all app states
  - No performance impact
  - Snapshots
  - Run comparison
  - …

- Cons
  - Only available in Cypress Cloud
  - Paid service
  - A lot of info at once
    - Can be confusing

a11y test automation – Cypress Accessibility

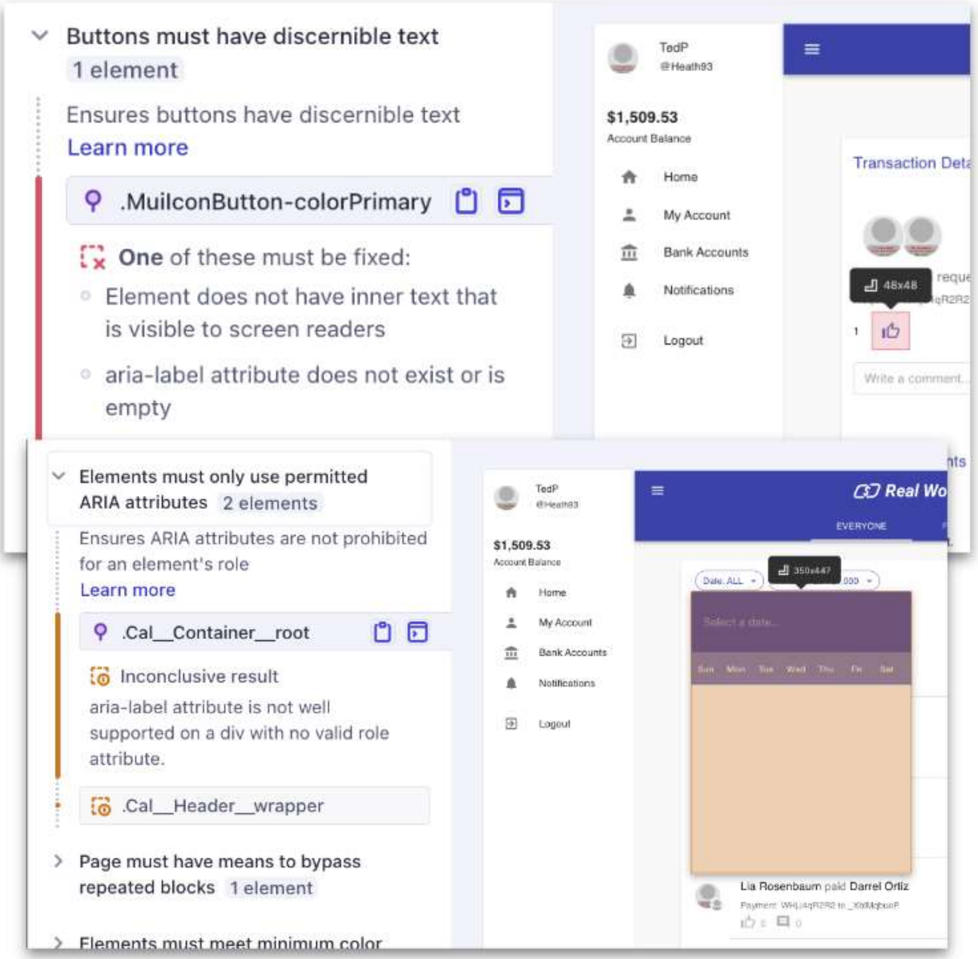


Cypress Accessibility Early Access

92% 1k 774 0 · Failed rules 16

Rules		Elements		
Elements must meet minimum color contrast ratio thresholds	Serious	86	721	0
<li> elements must be contained in a <ul> or <ol>	Serious	713	0	0
Images must have alternate text	Critical	269	0	0

Views	Snapshots	Score	Elements			Failed rules
/	257	89%	862	459	0	14
/contacts	69	86%	762	356	0	13
/personal	91	86%	873	482	0	13
/transaction/*	67	87%	19	26	0	7
/transaction/new	94	92%	20	31	0	7
/bankaccounts	24	95%	10	25	0	6
/bankaccounts/new	63	92%	12	12	0	6
/user/settings	62	92%	14	16	0	6



Buttons must have discernible text 1 element

Ensures buttons have discernible text

Learn more

.MuiIconButton-colorPrimary

One of these must be fixed:

- Element does not have inner text that is visible to screen readers
- aria-label attribute does not exist or is empty

Elements must only use permitted ARIA attributes 2 elements

Ensures ARIA attributes are not prohibited for an element's role

Learn more

.Cal__Container__root

Inconclusive result

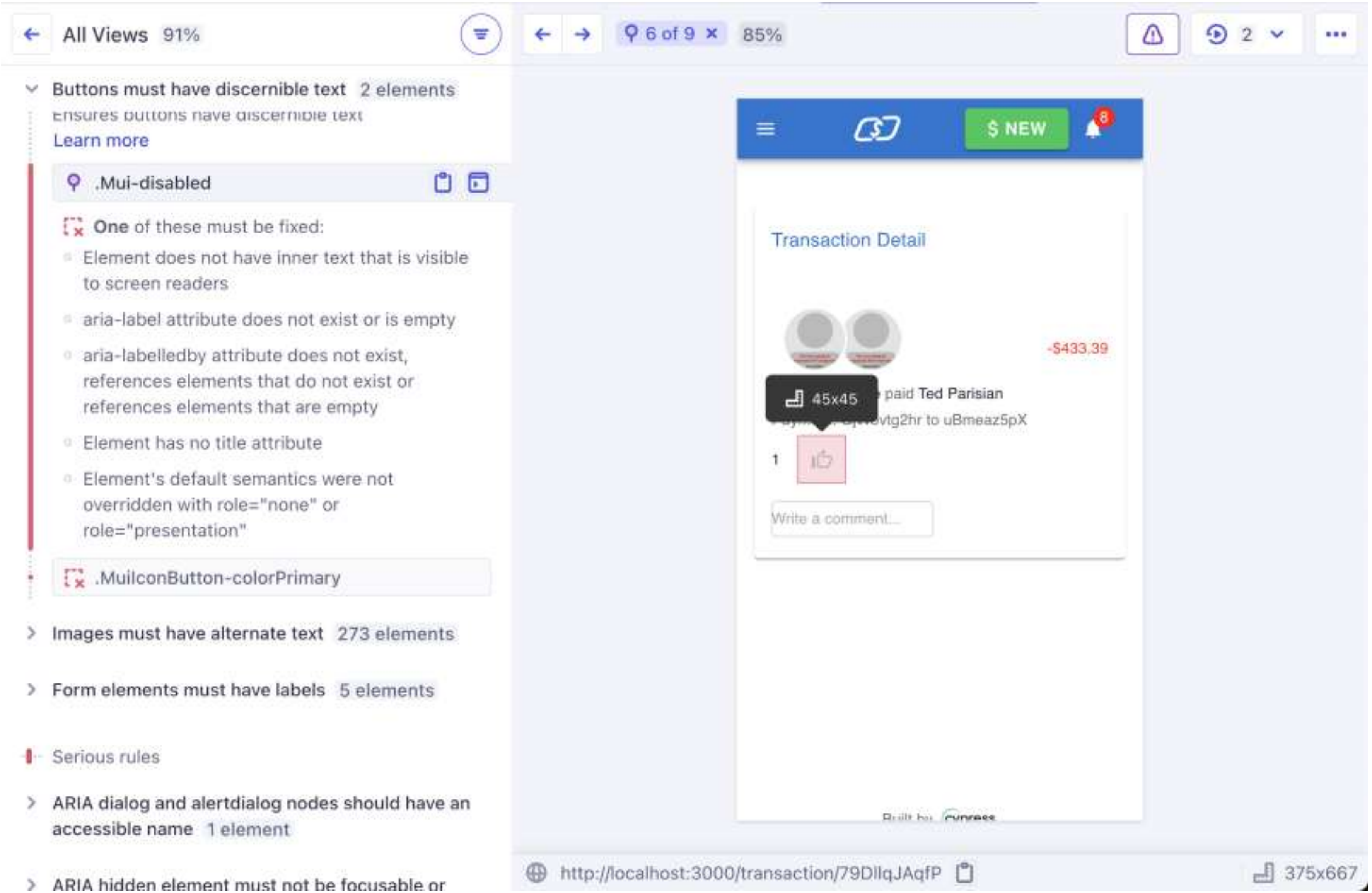
aria-label attribute is not well supported on a div with no valid role attribute.

.Cal__Header__wrapper

Page must have means to bypass repeated blocks 1 element

Elements must meet minimum color

a11y test automation – Cypress Accessibility



← All Views 91%

Buttons must have discernible text 2 elements

Ensures buttons have discernible text

Learn more

.Mui-disabled

One of these must be fixed:

- Element does not have inner text that is visible to screen readers
- aria-label attribute does not exist or is empty
- aria-labelledby attribute does not exist, references elements that do not exist or references elements that are empty
- Element has no title attribute
- Element's default semantics were not overridden with role="none" or role="presentation"

.MuiIconButton-colorPrimary

Images must have alternate text 273 elements

Form elements must have labels 5 elements

Serious rules

ARIA dialog and alertdialog nodes should have an accessible name 1 element

ARIA hidden element must not be focusable or

DEMO TIME

(again)

Accessible UI Development

Accessible UI development – HTML First, ARIA Second

- Use semantic HTML whenever possible
- MDN – HTML: A good basis for accessibility
- Useful attributes
  - aria-label, aria-describedby, role, tabindex, alt
- Keyboard control
- Screen reader support
- KISS is your friend
- Multiple ways to control the application
  - Problem: Drag & Drop

Key takeaways

- Native HTML first
- Mandatory for some sectors
- MFA – Multi-Factor Accessibility (color + text + sound…)
- Full keyboard navigation support
- Automate a11y tests
- **Accessibility means giving everyone a chance to use your awesome product**

Useful resources

- UX
  - Centigrade: Regarding Color Vision Deficiency in the Icon Design Process
- Dev + testing
  - MDN: Accessibility on the web
  - Cypress: Accessibility testing
  - Cypress Accessibility Demo
- Standards + legislative
  - Web Content Accessibility Guidelines (WCAG) 2.1
  - EN 301 549 (EU: Web Accessibility Directive)
  - Zákon č. 99/2019 Sb. – Zákon o přístupnosti internetových stránek a mobilních aplikací

PR time

"SAP is not stressful at all."
George, 25 years old
fb.com/SAPCult

"SAP is amazing,
I am loving it."
John, 2 years experience

Thank you.

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